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### **POLYMER PRESSURE MOLDING COMPOSITION**

#### **ABSTRACT**

Use: Production of polymer materials and may be utilized in various branches of industry for the production of articles from composite materials. Essence of invention: purpose of invention: increasing the physical-mechanical and frictional properties of pressure molding compositions by imparting to them greater water resistance, chemical resistance and heat resistance and also economical utilization of the waste products of the leather industry. This goal is achieved by the fact that the pressure molding composition also contains finely ground leather waste products (scraps) and zinc stearate and as the fiberlike filler instead of glass fibers use is made of the waste products of PAN fabric. The composition of the pressure molding composition is the following, wt. % Phenol-formaldehyde resin 23, PAN fabric wastes 10, latex 1.5, urotropin 1.0, zinc stearate 0.5, ground wood products 32, ground leather waste 32. The proposed pressure molding composition can be utilized for manufacturing by the method of direct pressure diecasting of various articles such as parts of a roller belt conveyer.

#### **Description**

The invention concerns the production of materials and may be utilized in various branches of industry for the production of articles from composite materials.

A wood-based pressure molding composition is known which includes ground wood (52-55 wt. %), resol phenol-formaldehyde resin

(22-25 wt.%), glass fiber (15-28 wt.%), latex (SBS-1 3-5 wt.%) and urotropin (1-2 wt.%) [1].

The shortcoming of this pressure molding composition is the low water resistance, chemical resistance and heat resistance, the relatively low physical-mechanical properties.

The object of the invention is to increase the physical-mechanical and frictional properties of the pressure molding composition by imparting to it greater water resistance, chemical resistance and heat resistance and also the economical utilization of the waste products of the leather industry.

The technical result is achieved by the fact that the polymeric pressure molding composition which consist of resol phenol-formaldehyde resin, a fibrous filler, latex, synthetic rubber, urotropin and ground wood, contains as a fiberlike filler the waste products of polyacrylonitrile fabric, as the synthetic rubber latex a latex of butadiene-nitrile rubber containing 40% nitrile units or a carboxylate latex containing 40% nitrile units of 3% methacrylic acid units and additionally pulverized waste products of leather and zinc stearate in the following ratio of components, wt.%:

resol phenol-formaldehyde resin	23
polyacrylonitrile fabric waste	10
butadiene-nitral rubber or carboxylate latex	1.5
urotropin	1.0
ground wood	32
ground leather (waste)	32
zinc stearate	0.5

Table 1 presents the formulation of the proposed polymer pressure molding composition and Table 2 the results of comparative tests of the proposed and of the conventional pressure molding

composition.

As may be seen for the results of the comparative tests, the proposed pressure molding composition has better physical-mechanical properties. It has higher frictional properties, water resistance, chemical resistance and thermal stability.

The technology of preparation of the pressure molding composition consists of the following:

The PAN fabric wastes are treated with latex in which zinc stearate is dispersed. The material obtained is mixed with the ground waste products of leather and ground wood with a moisture content no greater than 10%. Then the mixture is treated with the phenol-formaldehyde resin and urotropin.

The pressure molding machine is dried at 70-90°C to a moisture content of 4-8% (with allowance for volatiles).

The samples are prepared by the method of direct pressure diecasting in pressure molds at a temperature of 150-170°C, a pressure of 300 kg/cm<sup>2</sup> and a holding time under pressure of 1 minute per mm thickness of the article.

The density of the test samples is determined according to GOST 15139-69, the impact viscosity according to GOST 4647-69, the compression strength according to GOST 4651-69, the static flexural strength according to GOST 4648-71, the water absorption according to GOST 4650-73, and the heat resistance according to GOST 9551-60.

**Table 1. Composition of pressure molding composition**

Components	Content of components wt. %	
Phenol formaldehyde resin LBS-3 (dry residue)	23	23
PAN fabric waste obtained during production of synthetic fur ( <i>ostrig</i> or <i>knops</i> ) with a length of 0.5-30 mm (TU 17-09-121-82)	10	10
Latex brand SKN-40-1-[1] (dry residue)	1.5	--
Carboxylate latex brand BN-ZOK-2 TU 38.103562-84	--	1.5
Urotropin	1.0	1.0
Zinc stearate	0.5	0.5
Ground wood (cuttings 0.1-15 mm in size)	32	32
Ground leather waste (scrapings)	32	32

**Table 2. Basic properties of the proposed and known pressure molding compositions**

Characteristics	Pressure molding composition parameter		
	known	proposed	
Density, kg/m <sup>3</sup>	1350-1550	1320	1320
Impact viscosity J/m <sup>2</sup> •10 <sup>4</sup>	1.5-3.0	3.3	3.2
Compression strength N/m <sup>2</sup> •10 <sup>7</sup>	13.5-18.0	19.4	19.0
Static flexural strength, N/m <sup>2</sup> •10 <sup>7</sup>	8.5-12.0	13.6	13.5
Coefficient of sliding friction	0.15-0.20	0.42	0.41
Water absorption, %	2-3	1.1	1.0
Coefficient of permeability of a chemical reagent into sample, g•cm/cm <sup>2</sup> •s•10 <sup>-3</sup>	0.6	0.45	0.44
Thermal stability according to Martens, K	165-95	240	245

### Claims

Polymer pressure molding composition including a resol phenol-formaldehyde resin, a fibrous filler, a synthetic rubber latex, urotropin and ground wood characterized by the fact that as the fibrous filler it contains waste products of polyacrylonitrile fabric, as the synthetic rubber latex a butadiene-nitrile rubber latex containing 40% acrylonitrile units or a carboxylate latex

containing 40% acrylonitrile units and 3% methacrylic acid units and additionally ground leather wastes and zinc stearate, in the following ratio, wt.%.

resol phenol-formaldehyde resin	23
polyacrylonitrile fabric waste	10
butadiene-nitrile rubber or carboxylate latex	1.5
urotropin	1.0
ground wood	32
ground leather wastes	3
zinc stearate	0.5